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Three-dimensional Sonography in the Exploration of Voiding Dysfunction in Retroverted Impacted Adenomyosis: A Case Report

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SUMMARY

Objective: Retroverted impacted adenomyosis may cause progressive lower urinary bladder compression, resulting in bladder outflow obstruction and lower urinary tract symptoms. We report a case of a huge impacted adenomyosis in which the pathogenesis of bladder outflow obstruction was explored using three-dimensional sonography and was clearly shown to be different from that of pelvic-organ prolapse. The pathogenesis of urinary retention is described and discussed.

Case Report: A 43-year-old patient was admitted for acute urinary retention and a huge impacted retroverted uterus with adenomyosis. Sonographic study revealed that the lower urinary bladder was compressed by the cervix, which was upwardly and forwardly displaced. Three-dimensional sonography more clearly identified the bladder neck and adjacent tissue.

Conclusion: Sonography is helpful in exploring the anatomic nature of bladder outflow obstruction resulting from retroverted impacted adenomyosis. In this case, the urethra was neither distorted nor compressed, quite different from cases with pelvic organ prolapse. These two types of bladder outflow obstruction are not distinguishable using traditional urodynamic study. Three-dimensional sonography is more helpful in identification of the compressed reshaped lower urinary bladder and its adjacent anatomic structures, even without urine in the low bladder cavity as contrast. [*Taiwanese J Obstet Gynecol* 2005;44(1):69–71]

Key Words: adenomyosis, outflow obstruction, three-dimensional sonography

Introduction

Bladder outflow obstruction with acute urinary retention is frequently found in urogynecologic clinics and results from pelvic prolapse, uterine leiomyomata, ovarian neoplasms, or acutely retroverted gravid and nongravid uterus [1]. Generally, the various etiologies may have the same appearance on urodynamic examination, such as high detrusor pressure, low peak flow rate on voiding cystometry, and increased postvoiding residual volume [2]. Urethral kinking is the most common cause of bladder outflow obstruction in cases of pelvic organ prolapse and large cystocele and in patients with acute urinary retention after anti-incontinence surgery. However, Yang and Huang discovered that in patients with a retroverted large fibroid or retroverted gravid uterus, outflow obstruction can have another pattern, in which the point of obstruction is the internal urethral orifice instead of the mobile urethra [3]. We applied three-dimensional (3D) sonography in a case of retroverted adenomyosis and report the voiding dysfunction.

Case Report

A 43-year-old female patient was referred to our urogynecologic clinic in August 2002 for frequency, urgency, and acute urinary retention for 1 month.

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Gynecologic examination revealed a retroverted fist-sized uterus impacting the pelvis. Regular gynecologic sonography showed no fibroid and adenomyosis was suspected (Figure 1). The diagnosis after complete urodynamic study was bladder outflow obstruction and detrusor instability. Maximal cystometric capacity was within normal limits. Voiding-phase cystometry revealed a maximal detrusor pressure of 76 cmH_2O and a detrusor pressure at maximal flow rate of 66 cmH_2O. The voiding pattern was intermittent.

Sonographic imaging of the lower urinary tract was performed using a vaginal probe in the supine position. The sagittal view clearly showed that the upper urethra and bladder neck were compressed superiorly by the uterine cervix, which was pushed forward and upward (Figure 2). The lower part of the bladder had lost its normal urine-filled appearance, which made it more difficult to identify the position of the bladder neck. We measured the angle between the bladder neck-symphyseal line and the midline of the pubic symphysis, both at rest (Figure 3) and during the Valsalva maneuver (Figure 4), to define bladder neck mobility [3,4]. The angles at rest and in stress were 108° and 180°, respectively, showing that bladder neck mobility was not restricted. Three-dimensional sonography was then applied, focusing on the lower urinary bladder (Figure 5). After 3D reconstruction of the image, the margin of the pubic symphysis, uterine cervix, and upper urethra became much sharper. The compressed bladder neck appeared clearly and was laid against the posterior margin of the pubic symphysis to form a convex inward curvature. The cervix compressed the lower urinary bladder and reshaped it to a narrow curved cavity. Because the lower bladder cavity was so narrow and compressed and did not have urine accumulating inside, it could have been masked by the acoustic shadow of

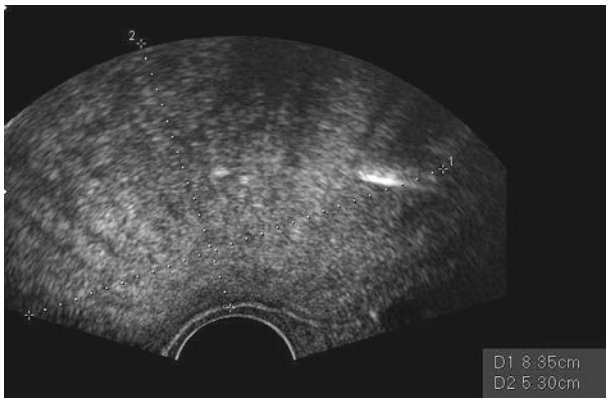

Figure 1. An 8.35 × 5.30 cm uterine corpus is retroverted and occupies the pelvic cavity, pushing the uterine cervix anteriorly and superiorly (right side, not visible on this picture).

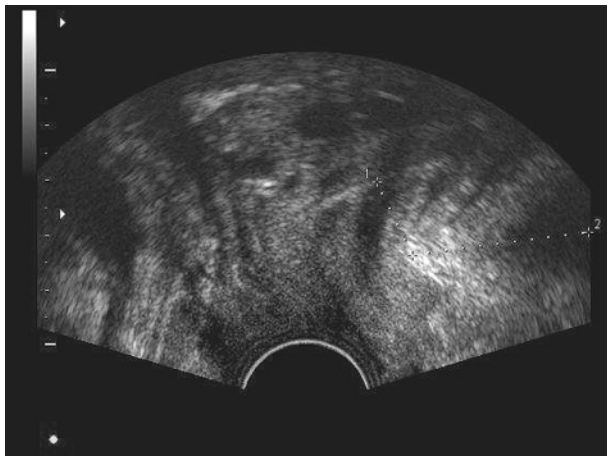

Figure 3. The angle between the bladder neck-symphyseal line and the midline of the pubic symphysis at rest is 108°.

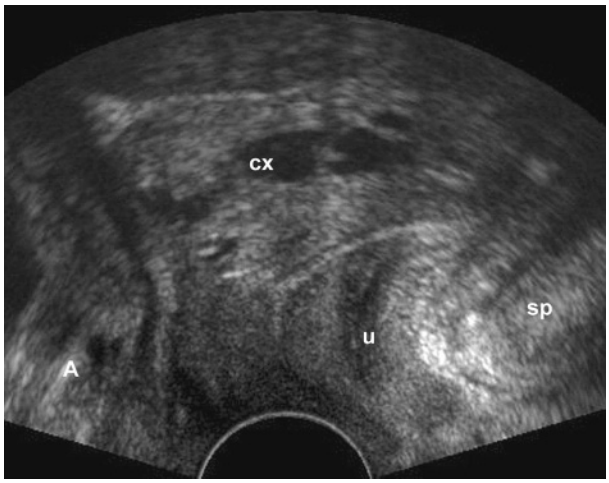

Figure 2. Sagittal plane at rest shows the cervix compressing the bladder neck superiorly. A = anus; CX = cervix; SP = pubic symphysis; U = urethra.

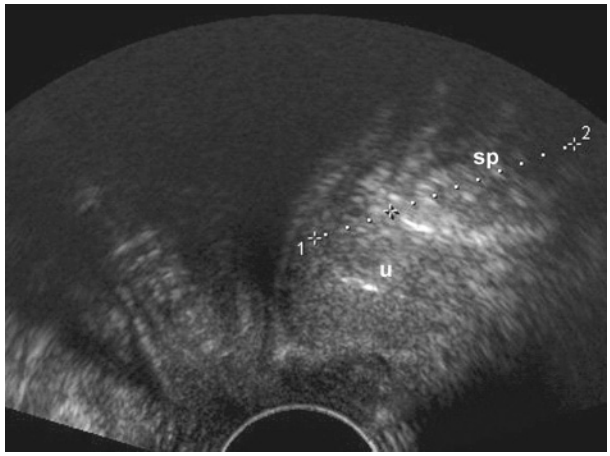

Figure 4. The angle between the bladder neck-symphyseal line and the midline of the pubic symphysis in stress is 180°. SP = pubic symphysis; U = urethra.

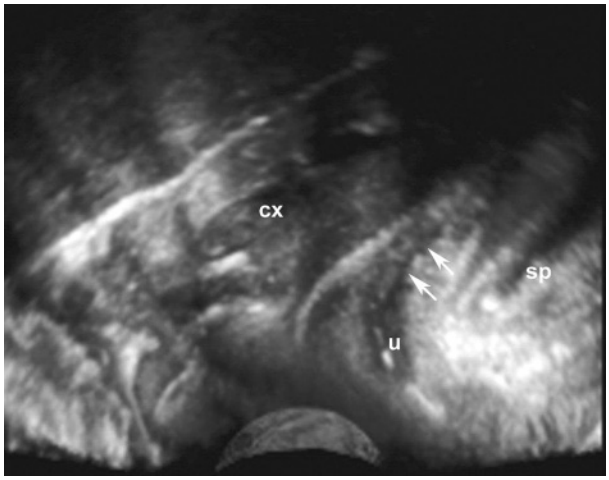

Figure 5. The compressed lower urinary bladder is clearly shown (arrows). CX = cervix; SP = pubic symphysis; U = urethra.

Figure 6. Postoperative follow-up image shows the lower bladder restored to its original position with urine accumulating inside. A = anus; SP = pubic symphysis; U = urethra.

the pubic bone in both transabdominal and transvaginal two-dimensional images. Three-dimensional sonography proved helpful in increasing image resolution, revealing the pathophysiology in the retropubic area.

The patient underwent hysterectomy. The pathologic report confirmed the clinical impression of adenomyosis without fibroids. The symptoms and signs of lower urinary tract obstruction were dramatically relieved after the operation. The patient was discharged on the fourth postoperative day without an indwelling urinary catheter. One month after the operation, the patient underwent another sonographic examination, which showed no compression and good urine-filling of the lower urinary bladder (Figure 6). She did not complain of voiding difficulty or urine leakage 3 months after the operation.

Discussion

Obstructive lesions resulting in voiding difficulty in women are usually caused by external compression or kinking of the urethra and bladder neck. The most frequent causes are pelvic-organ prolapse and huge cystocele. Rare cases of retroverted uterine myoma or gravid uterus with incarceration have been reported as responsible for acute urinary retention [5,6]. Adenomyosis, although similar to uterine myoma in some clinical aspects, has rarely been reported to cause bladder outflow obstruction.

Traditional urodynamic examination is not sufficient to assess the anatomic and functional pathogenesis of bladder outflow obstruction. It is now accepted that sonography can give precise images without radiation, and it is also more easily available than videocystourethrography [3,4].

Our group has previously reported that transvaginal sonography can be used to determine the pathogenesis of impacted retroverted myoma and gravid uterus with acute urinary retention [3]. In this patient, we used 3D sonography to confirm that the mechanism could also explain another condition, impacted uterus with adenomyosis. Our specific findings can be simplified into two points: the mechanism of voiding difficulty is due to compression of the lower bladder by the upward and forward displacement of the cervix, but not urethral kinking or compression, and 3D sonography is helpful in identifying the bladder neck and adjacent anatomic structures in the retropubic area.

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